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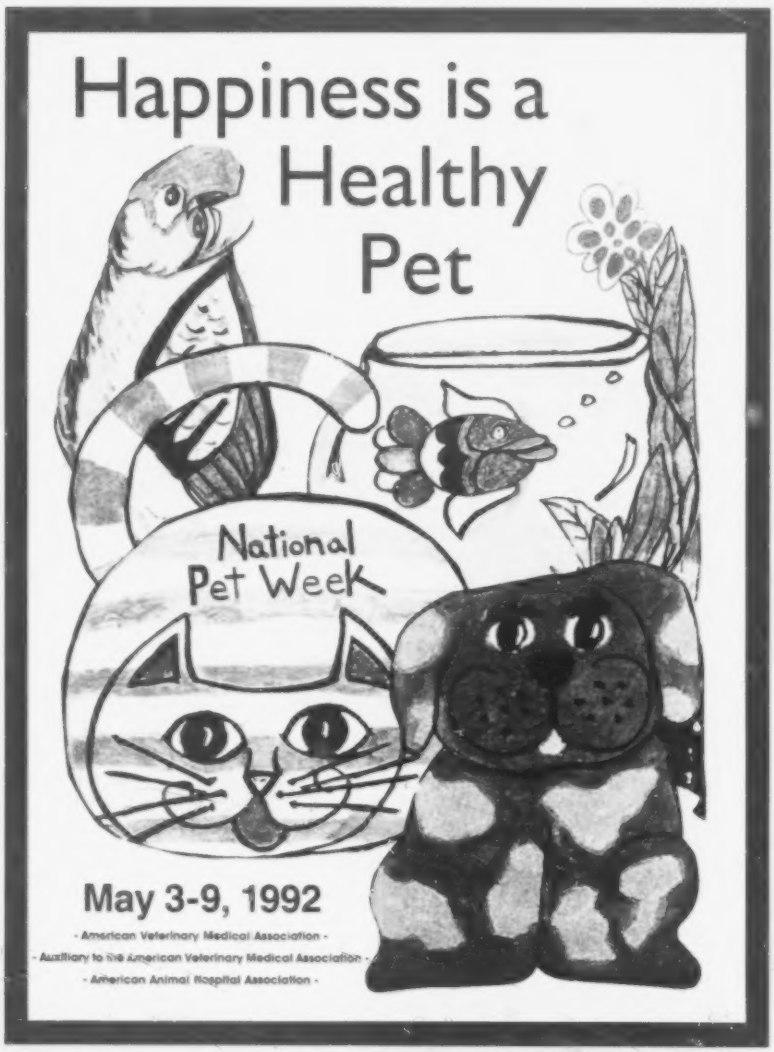
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# JOURNAL

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VBPA

# Characteristics of US veterinarians specializing in preventive medicine

William D. Hueston, DVM, PhD

The PEW Report[1] focused attention on preventive medicine as an integral component of clinical veterinary practice and as a separate field of specialization. The term veterinary preventive medicine, when used to identify a separate field of specialization, includes the disciplines of epidemiology and public health as well as the public practice categories of regulatory, extension, and military medicine. According to the PEW findings, the importance of veterinary preventive medicine will continue to expand although veterinary college curricula are not meeting the existing demand.[2]

Characterizations of veterinary specialties in the United States have followed the American Veterinary Medical Association (AVMA) membership codes[3] for professional activity, employment function, and type of employer. Most of the analyses of job functions, salaries, and employment opportunities have grouped all nonclinical practice veterinarians by type of employer regardless of professional activity or employment function.[4]

The purposes of the survey reported here were to describe the demographics, employment status, and salaries of veterinarians specializing in preventive medicine. Associations between employment characteristics and board certification by the American College of Veterinary Preventive Medicine (ACVPM) were quantified. Diplomates of the ACVPM were asked additional questions concerning the importance of board certification to their careers.

## Survey

A two-page, 18-item questionnaire was developed[5] to address employment characteristics and ACVPM certification status of veterinarians involved in preventive medicine. The questionnaire was designed to be self-administered and self-coding. Opportunities were provided for additional comments.

The survey sample was selected from two sources. First, all nonretired diplomates of the ACVPM (n = 354) were included. Second, a random sample of 532 names was selected from the AVMA membership list of 1,066 nondiplomate veterinarians with professional activity codes 30, 31, 36, 43, 50, or 91, corresponding to veterinary public health, veterinary preventive medicine, regulatory veterinary medicine, extension, military veterinary service, or epidemiology, respectively. The activity codes describe work reported by the veterinarians. Each AVMA member is allowed to identify up to three activity areas. Veterinarians listing employer type as retired were excluded. The sample of nondiplomates was larger than the sample of diplomates (ratio of 1.5:1) to compensate for an expected higher response rate among diplomates. The sample selection from the AVMA membership list was accomplished with a microcomputer random number generator.[6]

The questionnaire was mailed to the 886 veterinarians in January, 1990 following a modified total design method.[7] The first mailing included a cover letter, the questionnaire, and a pre-addressed, stamped, return envelope. The second mailing, mailed exactly 1 week later, consisted of a postcard reminder. Both mailings were sent with first-class postage.

The data from all respondents were entered into a microcomputer data base.[5] Analyses included descriptive statistics, $\chi^2$ tests for differences between proportions, one-way analysis of variance, and multiple linear regressions, using a microcomputer statistical analysis package.[5] Unless otherwise noted, $P < 0.05$ was accepted as the level of significance for all statistical analyses. The 95% confidence intervals for selected regression coefficients were included to facilitate interpretation. Comments were summarized as the percentage of respondents commenting rather than the percentage of comments, because each respondent could provide multiple comments.

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The author thanks Dr. Pamela J. Hand for technical assistance.

Presented to the Board of Councilors, American College of Veterinary Preventive Medicine, at the AVMA annual meeting in San Antonio, Tex, July 23, 1990.

## Survey results

*Response rates*—A total of 647 responses were received from the 886 veterinarians surveyed. After adjusting for 11 undeliverable questionnaires, deaths, or ineligibles, the corrected overall response rate was 73.9%. The response rate of ACVPM diplomates (83.5%) was significantly higher than nondiplomates (67%). Half of the responses were received within 9 days after the first mailing. The response time did not differ between diplomates and nondiplomates.

A total of 577 respondents (252 ACVPM diplomates and 325 nondiplomates; 89.2%) reported full-time employment in veterinary medicine. Respondents with less than full-time employment (ie, part-time, retired, unemployed, and graduate students) were excluded from the subsequent analyses. In addition, some respondents chose not to answer specific items, particularly the salary questions of which 11 of 577 or 1.9% were left blank.

*Demographics*—Females accounted for 10.3% of the respondents. Although the gender distribution of the 886 veterinarians in the original mailing was not known, a significant difference existed between the overall gender distribution of respondents: 3.6% females among the diplomates versus 15.5% females among the nondiplomates. The proportion of female diplomate respondents increased significantly over time when diplomates were stratified by year of ACVPM board certification ($\chi^2$ for trend analysis). Only 1.2% of the responding diplomates certified before 1981 were female, compared with 2.6% of diplomates certified between 1981 and 1985, and 11.7% of the diplomates certified since 1985.

Overall experience (years since graduation from veterinary college) averaged 19.9 years. Diplomates had significantly more experience (mean, 22.3 years; median, 22 years) than nondiplomates (mean, 18.1 years; median, 16 years).

Advanced degrees, in addition to the veterinary degree, were reported by 55.6% of the respondents (master's 45.9% and doctorate 9.7%). Diplomates had significantly more additional degrees. Seventy-three percent of the diplomates had master's degrees and 14.3% had doctorates vs 24.6% and 6.2% of the nondiplomates, respectively.

Specialty board certification other than ACVPM was reported by 9.1% of the respondents. Diplomates of ACVPM were significantly more likely to have other board certifications (14.9%) than nondiplomates (4.5%).

*Employment status*—Most of the respondents were employed by government, with 31.2% military, 28.6% other federal employees, and 20.5% state or local government. College or university employers accounted for another 13.3%. The remaining respondents listed private practice (2.8%), industry (3.6%), or other employers. Board certification in ACVPM was significantly associated with employer. Diplomates were more likely to be employed in the military, industry, university, or private practice than nondiplomates. Nondiplomates were more likely to be other federal, state, or local employees.

Veterinarians involved in preventive medicine averaged 35.4% of their time in administrative tasks; 10.3% in research-related activities; 7.7% teaching or preparing to teach; 6.3% in nonresearch field investigations or surveys; 6.3% practicing clinical veterinary medicine; 25.9% in regulatory or inspection activities; 2.5% in diagnostic laboratory work; and 5.5% in other activities. Diplomates reported significantly greater amounts of time in administrative tasks, research, teaching, and other activities such as consulting. Nondiplomates spent significantly more time in regulatory and inspection activities.

The respondents perceived their primary function as protecting the public health (43.9%) and protecting animal industry (20.7%). The perceptions were significantly different between diplomates and nondiplomates. Diplomates were more likely to associate teaching, research, meeting the needs of industrial employers, or reducing morbidity or mortality in individual animals with their primary function. Nondiplomates more frequently identified protecting animal industry as their primary function.

*Salaries*—The mean annual salary from the respondents' primary employment was $49,456 with a range of $15,000 to $145,000. Gender, advanced degrees, years of experience, employer, and ACVPM board certification were each associated with significant salary differences in univariate analyses. Salaries were significantly higher for males than females. Advanced degrees and experience were associated with higher salaries. Two sets of employers were clearly identifiable by salaries. Industry- and university-employed veterinarians had higher salaries than government, private practice, and others. Diplomates had higher salaries than nondiplomates.

To account for confounding, a multiple regression analysis was performed incorporating all of these variables. Experience was a continuous variable indicating years since graduation from veterinary college. Advanced degrees were treated as two dichotomous dummy variables: master's degree (yes/no), and doctorate (yes/no). The remaining variables also were handled as dichotomous dummy variables. Employer was coded as industry or university vs all others.

All of the variables except gender were significant predictors of primary income in the multiple regression. Experience explained the greatest amount of the difference in salary, followed by doctorate degree, board certification, employer, and master's degree (Table 1).

*Table 1—Regression for predictors of salary from primary employment*

| Source of variation | Regression coefficient | 95% CI | | Partial *F* test |
|---|---|---|---|---|
| | | lower | upper | |
| Experience (per year) | $549 | $451 | $648 | 119.4 |
| Doctorate degree (yes = 1, no = 0) | $7,728 | $4,032 | $11,424 | 16.8 |
| ACVPM board certification (yes = 1, no = 0) | $4,172 | $1,604 | $6,740 | 10.1 |
| Employer (industry/ university = 1, other = 0) | $4,745 | $1,705 | $7,785 | 9.4 |
| Master's degree (yes = 1, no = 0) | $3,905 | $1,371 | $6,440 | 9.2 |

Primary Salary = $33,232 + $549 (years of experience) + $7,728 (if doctorate) + $4,172 (if ACVPM diplomate) + $4,745 (if employed by industry or university) + $3,905 (if master's degree)
CI = Confidence interval

Additional income from secondary employment averaged $1,827; however, 83.4% of the respondents reported no income in addition to the salary from their primary employer. Using the multiple regression model, advanced education and gender were not significant factors in predicting additional income. In the final model, employer accounted for most of the variation, followed by experience and board certification. University- and industry-employed veterinarians had more additional income (mean of $1,987) than the others. Each year of experience was associated with an average of $67 more additional annual income. Board certification in ACVPM accounted for another $1,427 of additional annual income.

*Importance of board certification*—Most of the ACVPM diplomates (72.4%) believed that board certification helped their careers; however, less than half (41.6%) believed that board certification increased their earning power. Most of the diplomates (70.6%) expressed an interest in seeing increased benefits associated with diplomate status. A total of 203 suggestions for increased benefits were provided by 135 diplomates. The most frequently mentioned additional benefits included: encourage board certification as a job requirement (29.6%); pressure employers for more recognition of board certification (28.1%); more public relations to increase board stature (17.8%); more continuing education and scientific programs (17.8%); and more information on job opportunities (15.6%).

Among the nondiplomates, less than half (44.8%) responded that they have considered taking the ACVPM certification examination. A total of 208 reasons for not considering ACVPM board certification were provided by 190 nondiplomates. The most frequently cited reasons included: do not know about the board or need more information (18.9%); do not see any benefits or advantages to board certification (15.3%); not applicable to present job (14.7%); too busy (12.1%); too old (10%); or not interested (10%).

## Interpretation of survey results

The high response rate suggested that the survey addressed concerns held by many veterinarians involved in preventive medicine. The reason for the paucity of private practitioners in the sample was unclear. The AVMA activity codes may be presented in such a way that the practice codes (10-19) are seen to be mutually exclusive of the other codes. Alternatively, private practitioners may not perceive a part of their clinical practice activity as preventive medicine or public health. Within the ACVPM diplomates responding, the private practitioners probably represent second careers for veterinarians after careers in public practice.

The veterinarians responding to this survey were primarily public practitioners employed by government or universities. The proportion of respondents with additional education beyond the veterinary degree was surprisingly high, suggesting that additional education was important to their job responsibilities. The distribution of work activities suggested various responsibilities, although administrative and regulatory activities accounted for more than a quarter of the average work week.

Mean salaries for veterinarians involved in preventive medicine appeared to be similar to the mean income for veterinarians in private practice and public practice as estimated in the AVMA biennial economic survey of 1987.[4] Total income (primary salary plus additional annual income) for the preventive medicine respondents in private practice was $53,214 (n = 14) compared with $51,138 (n = 552) for public practice respondents, whereas the AVMA survey figure for all veterinarians in private practice was $52,643 compared with $51,995 for all veterinarians not in private practice.

Conversely, the multiple regression model predicted starting salaries $10,000 higher than the AVMA statistics for new graduates. The model estimated a starting salary of $33,233 for a new graduate entering the preventive medicine field with no advanced degrees, no board certification, and employed in private practice, military, or other federal, state, or local government. The starting salary for preventive medicine practitioners in universities or industry would be even higher. The annual AVMA statistics on new graduates reported actual starting salaries for 1989 of $24,742 for private practice and $23,645 for nonprivate practice.[8] Unfortunately, the figures are not directly comparable, because the nonprivate practice includes both university and industry employment and may include individuals pursuing advanced education.

The inability of the multiple regression model to accurately predict starting salaries may also be attributed to the manner in which veterinarians enter preventive medicine practice. New graduates overwhelmingly chose private practice (78%) or advanced study (15.2%) as their first jobs. Only 3.6% enter the public practice areas of university,

military, other federal, state, or local government, or industry, where preventive medicine is more likely to be a major recognized job function.[9] The timing of the survey, late winter, assured that no new graduates (0 experience) would be surveyed; however, only 32 (5.5%) of the full-time employed respondents reported between 1 and 5 years of experience. The relative lack of less experienced veterinarians reporting preventive medicine activities paralleled the observation that many veterinarians enter preventive medicine, particularly public preventive medicine practice, after changes in career direction or completion of advanced education.

Reports from the AVMA biennial economic survey confirm the positive correlation between experience and salary.[10] Another report from the same survey provided additional evidence for two distinct income clusters within public veterinary practice. The college/university, industry/commerce, and other/not-for-profit cluster had higher mean salaries ($50,739, $65,321, and $51,747, respectively) than the federal government, state or local government, and armed forces ($45,477, $45,500, and $43,365, respectively).[4] The difference in incomes between the clusters was roughly equivalent to the difference predicted by the multiple regression analysis, $6,658.

The characteristics of ACVPM diplomates were different from those of nondiplomates. The diplomates were more experienced, had more education, and were more likely to be male. Interestingly, the difference in experience (4.1 years) was close to the minimal experience currently required for eligibility for the ACVPM Boards (6 years experience, or graduate training plus experience equaling 6 years). If the nonboard-eligible respondents (5 years experience or less) are removed from the nondiplomates, the mean experience level of diplomates and nondiplomates differed by <1 year. Gender and education differences also were diminished. In part, the gender differences reflected the changing demographics of the veterinary profession. The proportion of women being certified in ACVPM has increased significantly through the past decade, paralleling the overall increase in women entering the profession.

The differences in diplomates' perception of their primary function related principally to differences in their primary employer. The differences in time allotted to various activities also reflected the difference in employers and the difference in experience. As experience increased, time allotted to administrative duties increased significantly.

The ACVPM diplomates had higher salaries than nondiplomates. Analysis of a survey of laboratory animal veterinarians revealed a salary difference of $11,188 when American College of Laboratory Animal Medicine (ACLAM) board-certified veterinarians were compared to non-board-certified members of the American Society of Laboratory Animal Practitioners (ASLAP).[a] This difference was slightly higher than the unadjusted $9,823 difference between ACVPM diplomates and nondiplomates. After adjusting by the multiple regression model for the differences in experience, advanced education, and employer, the ACVPM diplomates made an average of $4,172 more in annual salary from their primary employers and additional income of $1,427 more than nondiplomates. An adjustment for potential confounders of the salary differences was not reported in the ACLAM/ASLAP study even though the report noted salary differences for experience, gender, employer, and advanced education.

Caution must be exercised in interpreting the results of these analyses. The significant difference in salary did not necessarily prove a cause-and-effect relationship between board certification and income. Less than half of the ACVPM diplomates believed that the board certification had increased their earning power, although most diplomates believed that board certification had helped their careers. Board certification may be a prerequisite for certain types of advancement. The data collected in this survey did not allow the question of causality to be answered conclusively, although anecdotal evidence from the comments suggests that board certification is a prerequisite for promotion in the military.

A survey of military and other federal veterinarians corroborated the perceived importance of ACVPM board certification for preventive medicine careers in the federal government.[b] When asked their opinion of the value of ACVPM diplomate status to their career, the most frequently selected response was high on a 6-point scale ranging from none to very high. Respondents also strongly recommended that colleagues pursue diplomate status.

Another interesting finding was the relationship between employer and additional income from secondary sources. Many governmental positions (especially military and federal government) disallow outside professional activities, whereas private practice employers, universities, and industry allow and even encourage outside consultation. Only 10.3% of federal and 5.0% of military employees acknowledged additional income, compared with 22% of state employees, 33.3% of industry employees, 40.3% of university employees, and 50% of the private practitioners. Therefore, the disparity between the total income of military and federal preventive medicine practitioners and the income of veterinarians working for other employers was heightened, especially with regard

[a]Liebenberg SP, Reed HJ. Results of the 1987 ACLAM and ASLAP Economic Survey. Unpublished report to the Presidents of the American College of Laboratory Animal Medicine and the American Society of Laboratory Animal Practitioners, 1987.

[b]Sherman SJ. Addition of a Zoonotic Disease and Regulatory Medicine Path to the MPH Program. Unpublished report to the Uniformed Services University of the Health Sciences, 1990.

to the high end of the salary scale. The highest salaries reported in this survey by university, industry, private practice, military, other federal government, and state and local government were $122,000, $145,000, $105,000, $84,000, $82,500, and $93,000, respectively.

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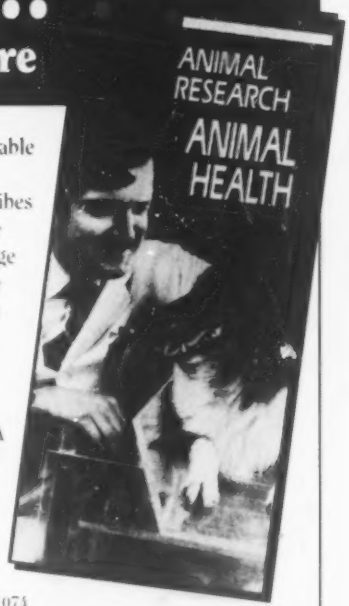


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